CLAIMS

1.   A process for measuring surface reflectance $(\hat{r})$ of an object of interest in a set of image data (i) said process comprising the steps of:

collect the set of image data (i) which contains the surface reflectance of the object of interest as well as additive noise caused by variations in illumination and atmospheric effects;

make an estimate of the additive noise (a) in the set of image data;

process the image data in a high pass filter to remove the estimate of additive noise (a) from the set of image data (i) and getting thereby a processed image set (rm)

Use a Discrete Cosign Transform (DCT) on the processed image set to estimate an amount of image signal lost due to atmospheric effects est (rm);

add the estimate of image signal lost to the processed image set to get a sum reflectance estimate; and

process the sum reflectance estimate with a multiplicative noise only algorithm to obtain thereby the surface reflectance $(\hat{r})$ of the object of interest.

2.   A process, as defined in claim 1, wherein said collection step is performed using image sensors that detect image data in a form of pixel spectral vectors $\{x\}$ and which output an image $(i)=rm$ where r equals the surface reflectance of the object of interest and m is a multiplicative noise spectrum.

3.   A process, as defined in claim 2, wherein there are N channels of pixel spectral vectors $\{x\}$ that are rotated into a log m principle component (PC) space to produce a rotated ensemble set $\{y\}$.

4.   A process, as defined in claim 3, wherein image formation of the object of interest is elicited by performing a Hadamard product of the rotated ensemble set $\{y\}$.